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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| EXAMINER |
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ROJAS, OMAR R

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| ART UNIT | PAPER NUMBER |
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2874

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 12/19/2006 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/533,663

Applicant(s)

WAKITA ET AL.

Examiner

Omar Rojas

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-14 and 22-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22,23,26,28 and 30 is/are allowed.
- 6) ☒ Claim(s) 1,3,5-14,24,25,27 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☒ Other: Detailed Action.

DETAILED ACTION

Response to Amendment

1. With regards to the amendment filed on October 2, 2006, all the requested changes to the claims have been entered. Claims 1, 3, 5-14, and 22-30 are pending.

Response to Arguments

2. Applicant's arguments filed October 2, 2006 with respect to Maher (US 4,128,299) and Dalisa et al. (US 4,218,302) have been fully considered and are persuasive. The rejection of claims 1-3, 5, 8, 12, and 14 in view of Maher and the rejection of claims 1, 15-19, 21, and 28 in view of Dalisa et al. have been withdrawn.

3. Applicant's arguments filed October 2, 2006 with respect to Ghezze et al. (US 5,367,585) have been fully considered but they are not persuasive. On page 8 of the remarks, applicant(s) argue that "Ghezze et al. fails to disclose a display element that extracts light out of the display element as required by claim 1." The examiner disagrees with this assertion and considers the aforementioned limitation to be inherently present in Ghezze et al. because the Ghezze patent discloses an identical structure to that recited by claim 1. Therefore, the rejection of claims 1, 3, 5-7, 9, 11, 12, and 14 in view of Ghezze has been maintained and is repeated below.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "reflection direction" recited by claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 1 is objected to because of the following informalities: Claim 1 recites the limitation "the reflection direction" in line 10. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.
6. Claim 22 is objected to because of the following informalities: Claim 22 recites the limitation "the particle" in the last line. This makes the claim vague because it is not unclear which particle is being referred to. Appropriate correction is required.

Art Unit: 2874

7. Claim 25 is objected to because of the following informalities: Claim 25 recites the limitation "the actuator" in line 4. This makes the claim vague because it is not clear which actuator is being referred to. Appropriate correction is required.

Claim Rejections - 35 USC § 102

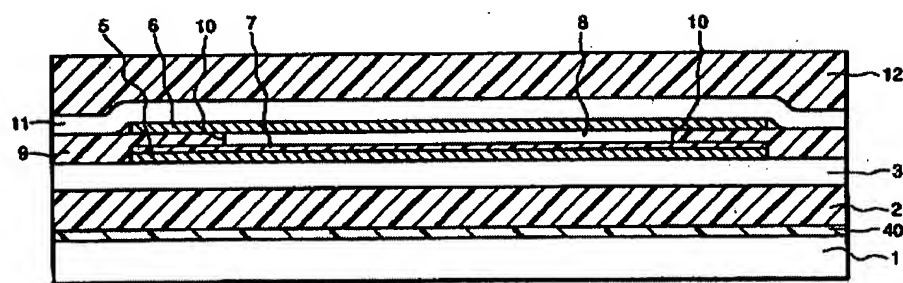
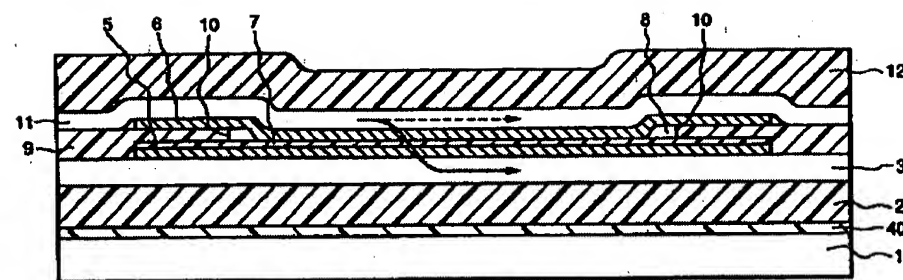
8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claims 1, 3, 5-7, 9, 11, 12, and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Patent No. 5,367,585 to Ghezzi et al. ("Ghezzi") of record.**

In re claim 1, Ghezzi discloses a display element (e.g., see Figures 1a-1b) comprising a light source for providing light and a waveguide that comprises a deformable core 11 that propagates a light emitted from the light source, wherein the light propagated in the waveguide is extracted to outside from a waveguide lateral face,

the display element further comprising a plurality of actuators 5/6/7 that deform a shape of the waveguide,

wherein the actuators 5/6/7 are operated selectively to deform a surface shape of at least a portion of the core 11 on the waveguide lateral face to a concavo-convex shape so as to change a reflection direction of light propagated in the waveguide thereby *inherently* extracting light out of the display element from the waveguide lateral face. Figures 1a-1b of Ghezzi are reproduced below.

**FIG. 1a****FIG. 1b**

In re claim 3, the waveguide comprises a cladding 8/9 formed along one lateral face of the core 31, wherein the actuators 5/6/7 are attached to the cladding 8/9 and the shape of the waveguide lateral face is changed by deforming the actuators.

In re claims 5-7, the embodiment shown in Figures 3a-3b of Ghezzi shows all the recited limitations with references numerals 12-14 of Ghezzi corresponding to the claimed actuators.

In re claim 9, the actuators comprise: an electrode film 6 arranged at the waveguide lateral face, and an external electrode film 5 that is in opposition to and adjacent to the waveguide, wherein the shape of the waveguide lateral face is changed by an electrostatic force produced by applying a voltage between the external electrode film 6 and the electrode film 5.

Art Unit: 2874

In re claims 11-12, the waveguide core 11 is elastic and deforms to extract light out of the waveguide as seen in Figures 1a-1b.

In re claim 14, since no additional device structure is positively recited by claim 14, no patentable weight has been given to this claim.

10. Claims 1, 3, 8-12, and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Patent No. 4,106,848 to Conwell ("Conwell").

In re claim 1, Conwell discloses a display element (e.g., see Figures 1-2) comprising a light source 16 for providing light and a waveguide that comprises a deformable core 10 that propagates a light emitted from the light source 16, wherein the light propagated in the waveguide is extracted to outside from a waveguide lateral face 26,

the display element further comprising a plurality of actuators 20/24 that deform a shape of the waveguide,

wherein the actuators 20/24 are operated selectively to deform a surface shape of at least a portion of the core 10 on the waveguide lateral face to a concavo-convex shape so as to change a reflection direction of light propagated in the waveguide thereby extracting light out of the display element from the waveguide lateral face as seen in Fig. 2. Figures 1-2 of Conwell are

Art Unit: 2874

reproduced below.

Fig. 1

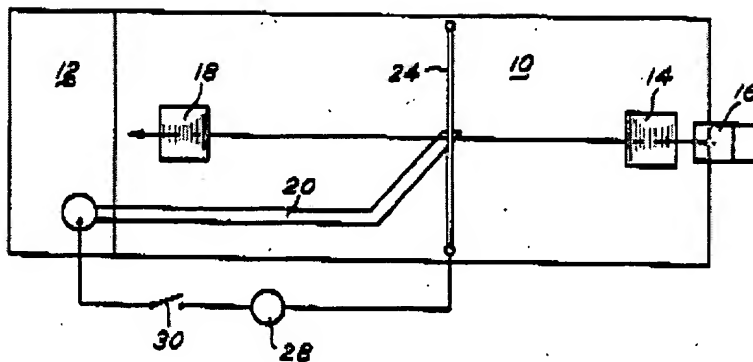
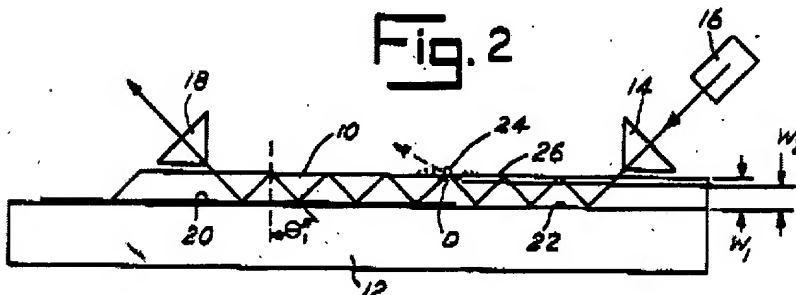


Fig. 2



In re claims 8-12, the actuators 20/24 comprise a round electrode film/filament 24 arranged at the waveguide lateral face and comprising a convex portion; and

an external electrode film 20 in opposition to and adjacent to the waveguide

wherein the shape of the waveguide lateral face 26 is changed by an electrostatic force between the films 20 and 24 and pressure to the waveguide lateral face with the convex portion is made by using the electrostatic force;

and the pressure causes the waveguide core 10 to deform and the core is an elastomer (see columns 2-3).

In re claim 14, since no additional device structure is positively recited by claim 14, no patentable weight has been given to this claim.

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conwell as applied to claim 1 above, and further in view of Patent No. 4,529,789 to Kroupa.

Conwell discloses the claimed invention except for a transparent gel. The Kroupa patent teaches forming a waveguide using a transparent gel. *See* Kroupa Abstract. The motivation for combining Kroupa with Conwell would have been to improve pressure sensitivity of the waveguide. *See* Kroupa at col. 2, lines 39-64. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claim 13 by combining Kroupa with Conwell.

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conwell as applied to claim 1 above, and further in view of Zhou et al., "Waveguide Panel Display Using Electromechanical Spatial Modulators", SID 98 Digest, pages 1022-1025 of record.

Conwell discloses the claimed invention except for a 3-color LED or a 3-color laser. The Zhou et al. articles discloses using a 3-color LED to inject light into a waveguide at pages 1024-1025. The motivation for combining Zhou with Conwell is to achieve a full-color display using reliable LEDs. *See* Zhou at page 1025. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claim 24 by combining Zhou with Conwell.

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conwell as applied to claim 1 above, and further in view of Patent No. US 6,369,867 B1 to Ge of record.

Conwell discloses the claimed invention except for a light source drive circuit for driving the light source, an actuator drive circuit for applying a voltage between the waveguide electrode film and the opposing electrode film, and a control circuit that controls the light source drive circuit and the particle drive circuit. The Ge patent, on the other hand, discloses a light source drive circuit 736 for driving a light source and a drive/control circuit 750 that controls both the light source drive circuit and an actuator drive circuit. The motivation for combining Ge with Conwell is to provide active display capability with sequential addressing of the entire display. *See* Ge at col. 8, lines 18-27. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claims 25 and 26 by combining Ge with Conwell.

15. Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conwell as applied to claim 14 above, and further in view of Patent No. US 6,912,082 B1 to Lu et al. ("Lu") of record.

Conwell discloses the claimed invention except for an active matrix element comprising a TFT that controls the respective actuators 36. The Lu patent, on the other hand, discloses an active matrix element 140 comprising a TFT that controls a respective actuator 115. One motivation for combining Lu with Conwell would be to minimize the size and voltage requirements of the actuators in Conwell using micro-electro-mechanical ("MEMS") technology. *See* Lu at col. 2, lines 30-35. Therefore, it would have been obvious to one of ordinary skill in

Art Unit: 2874

the art at the time of the claimed invention to obtain the invention specified by claims 27 and 29 by combining Lu with Conwell.

Allowable Subject Matter

16. Claims 22, 23, 26, 28, and 30 are allowed.

17. The following is an examiner's statement of reasons for allowance: The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of independent claim 22 in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in claims 22, 23, 26, 28, and 30 wherein a display element comprises a waveguide, electrode films, and fluorescent particles arranged in the specified manner and operating as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

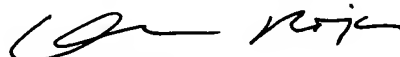
Art Unit: 2874

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357. The examiner can normally be reached on Monday-Friday (12:00PM-8:00PM).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and After Final communications is (571) 273-8300. The examiner's RightFAX number is (571) 273-2357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Omar Rojas
Patent Examiner
Art Unit 2874

or
December 11, 2006



MICHELLE CONNELLY-CUSHWA
PRIMARY EXAMINER
12/11/06